

CLAIMS

1. A motor housing assembly for housing a motor, the motor having a casing defining an axial length and an output shaft extending from the casing, the motor housing assembly comprising:

5 a housing defining a cavity with an open end for receiving the
motor and a partially closed end opposite the open end such that the output shaft
can extend from the partially closed end but the motor cannot be removed from
the housing through the partially closed end, the housing having a length larger
than the axial length of the casing such that the entire casing of the motor can be
0 received within the cavity;

an end cap configured to substantially close the open end of the housing and retain the motor in the housing;

a first isolator member configured to be sandwiched between the casing and the end cap to substantially isolate the motor from both the housing and the end cap; and

a second isolator member configured to be sandwiched between the casing and the housing to substantially isolate the motor from the housing.

2. The motor housing assembly of claim 1, wherein the housing
20 includes a notch configured to receive an electrical connector of the motor, and
wherein the motor housing assembly further includes a piece of sealing and
vibration isolating material coupled to the housing adjacent the notch.

3. The motor housing assembly of claim 1, wherein the housing includes a mounting flange extending radially from the housing between the open end and the partially closed end for mounting the housing to a vehicle.

5 4. The motor housing assembly of claim 3, wherein the mounting flange includes a plurality of mounting holes for receiving fasteners.

10 5. The motor housing assembly of claim 3, wherein the housing includes a plurality of locking tabs adjacent the mounting flange.

6. The motor housing assembly of claim 1, wherein the partially closed end is defined by a plurality of ribs.

15 7. The motor housing assembly of claim 1, wherein the housing includes a plurality of resilient locking tabs adjacent the open end and configured to engage the end cap such that the end cap can be coupled to the open end without the use of tools or fasteners.

20 8. The motor housing assembly of claim 1, wherein the housing includes an air inlet aperture communicating with the cavity, and a baffle portion adjacent the air inlet aperture to provide cooling air flow into the cavity.

9. The motor housing assembly of claim 1, wherein the first isolator member includes a plurality of projections configured to be received in a corresponding plurality of apertures in the end cap to substantially prevent relative movement between the first isolator member and the end cap.

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10. The motor housing assembly of claim 1, wherein the first isolator member is integrally formed with the end cap.

11. The motor housing assembly of claim 1, wherein the second
10 isolator member is sandwiched between the casing and the partially closed end of
the housing.

12. A self-contained HVAC drive unit for mounting to a vehicle, the unit comprising:

a motor having a rotor, a stator, a casing surrounding the rotor and the stator and defining an axial length, and an output shaft extending from the casing;

10 a housing defining a cavity with an open end for receiving the
motor and a partially closed end opposite the open end such that the output shaft
can extend from the partially closed end but the motor cannot be removed from
the housing through the partially closed end, the housing having a length larger
than the axial length of the casing such that the entire casing of the motor is
received within the cavity;

an end cap coupled to the open end of the housing to substantially close the open end of the housing and retain the motor in the housing;

15 a first isolator member sandwiched between the casing and the end cap to substantially isolate the motor from both the housing and the end cap; and a second isolator member sandwiched between the casing and the housing to substantially isolate the motor from the housing.

20 13. The self-contained HVAC drive unit of claim 12, wherein the
motor includes an electrical connector, wherein the housing includes a notch
configured to receive the electrical connector, and wherein the drive unit further
includes a piece of sealing and vibration isolating material sandwiched between
the electrical connector and the notch.

14. The self-contained HVAC drive unit of claim 12, wherein the housing includes a mounting flange extending radially from the housing between the open end and the partially closed end for mounting the housing to the vehicle.

5 15. The self-contained HVAC drive unit of claim 14, wherein the mounting flange includes a plurality of mounting holes for receiving fasteners.

10 16. The self-contained HVAC drive unit of claim 14, wherein the housing includes a plurality of locking tabs adjacent the mounting flange.

17. The self-contained HVAC drive unit of claim 12, wherein the partially closed end is defined by a plurality of ribs.

15 18. The self-contained HVAC drive unit of claim 12, wherein the housing includes a plurality of resilient locking tabs adjacent the open end and configured to engage the end cap such that the end cap can be coupled to the open end without the use of tools or fasteners.

20 19. The self-contained HVAC drive unit of claim 12, wherein the housing includes an air inlet aperture communicating with the cavity, and a baffle portion adjacent the air inlet aperture to provide cooling air flow into the cavity.

20. The self-contained HVAC drive unit of claim 12, wherein the first isolator member includes a plurality of projections configured to be received in a corresponding plurality of apertures in the end cap to substantially prevent relative movement between the first isolator member and the end cap.

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21. The self-contained HVAC drive unit of claim 12, wherein the first isolator member is integrally formed with the end cap.

22. The self-contained HVAC drive unit of claim 12, wherein the
10 second isolator member is sandwiched between the casing and the partially closed
end of the housing.

23. A method of assembling a self-contained HVAC drive unit, the drive unit including a motor having a casing, and a motor housing assembly for housing the motor, the motor housing assembly including a housing with an open end, an end cap, and first and second isolator members, the method comprising:

5 inserting the motor into the open end of the housing until the casing
is completely within the housing;

sandwiching the first isolator member between the casing and the housing to substantially isolate the motor from the housing;

coupling an end cap to the open end of the housing to retain the

10 motor within the housing; and

sandwiching the second isolator member between the casing and the end cap to substantially isolate the motor from the housing and the end cap.

24. The method of claim 23, wherein sandwiching the first isolator

15 member between the casing and the housing includes inserting the first isolator
member into the housing prior to inserting the motor into the housing.

25. The method of claim 23, wherein sandwiching the first isolator member between the casing and the housing includes coupling the first isolator member to the casing prior to inserting the motor into the housing.

26. The method of claim 23, wherein sandwiching the second isolator member between the casing and the end cap includes inserting the second isolator member into the housing after inserting the motor and prior to coupling the end cap to the open end.

27. The method of claim 23, wherein the second isolator member is coupled to the end cap and wherein sandwiching the second isolator member between the casing and the end cap occurs substantially simultaneously with coupling the end cap to the open end.

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28. The method of claim 23, wherein coupling the end cap to the open end further includes compressing the first and second isolator members until the end cap is retainably engaged by the housing without the use of fasteners.

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29. The method of claim 23, wherein the motor further includes an electrical connector, and wherein the housing further includes a notch configured to receive the electrical connector, the method further comprising:
aligning the electrical connector with the notch prior to inserting the motor into the housing.

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30. The method of claim 29, further comprising:
sandwiching a piece of sealing and isolating material between the electrical connector and the housing, adjacent the notch.

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31. A method of assembling and mounting a self-contained HVAC drive unit to a vehicle having an air case, the drive unit including a motor having a casing, and a motor housing assembly for housing the motor, the motor housing assembly including a housing with an open end, an end cap, and first and second isolator members, the method comprising:

inserting the motor into the open end of the housing until the casing is completely within the housing;

sandwiching the first isolator member between the casing and the housing to substantially isolate the motor from the housing;

10 coupling an end cap to the open end of the housing to retain the motor within the housing;

sandwiching the second isolator member between the casing and the end cap to substantially isolate the motor from the housing and the end cap; and

15 mounting the housing to the air case.

32. The method of claim 31, wherein sandwiching the first isolator member between the casing and the housing includes inserting the first isolator member into the housing prior to inserting the motor into the housing.

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33. The method of claim 31, wherein sandwiching the first isolator member between the casing and the housing includes coupling the first isolator member to the casing prior to inserting the motor into the housing.

34. The method of claim 31, wherein sandwiching the second isolator member between the casing and the end cap includes inserting the second isolator member into the housing after inserting the motor and prior to coupling the end cap to the open end.

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35. The method of claim 31, wherein the second isolator member is coupled to the end cap and wherein sandwiching the second isolator member between the casing and the end cap occurs substantially simultaneously with coupling the end cap to the open end.

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36. The method of claim 31, wherein coupling the end cap to the open end further includes compressing the first and second isolator members until the end cap is retainably engaged by the housing without the use of fasteners.

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37. The method of claim 31, wherein the motor further includes an electrical connector, and wherein the housing further includes a notch configured to receive the electrical connector, the method further comprising:

aligning the electrical connector with the notch prior to inserting the motor into the housing.

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38. The method of claim 37, further comprising:
sandwiching a piece of sealing and isolating material between the electrical connector and the housing, adjacent the notch.

39. The method of claim 31, wherein the housing includes a mounting flange having mounting holes, and wherein mounting the housing to the air case includes inserting fasteners through the mounting holes and through the air case.

5 40. The method of claim 31, wherein the housing includes locking tabs configured to engage the air case in a twist-lock manner, and wherein mounting the housing to the air case includes inserting the housing into the air case and rotating the housing such that the locking tabs secure the housing in the air case.